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ABSTRACT

This paper begins by contrasting theories of teaching (which are predictive) to theories of learning (which are descriptive). It justifies the feasibility theory of distance teaching by asserting that methods of distance teaching can affect the pace and direction of learning; therefore, it should be feasible to develop a theory of distance teaching. After a caution that it is impossible to develop a theory of distance teaching that is universally applicable to all students, all conditions, and all subject areas, a prescriptive theory of distance teaching is outlined. The theory asserts that distance teaching will support student motivation and promote learning pleasure and effectiveness if it is provided in such a way that (1) students believe that the subject of study is relevant to their individual needs, (2) students are made to feel a sense of rapport with the distance education institution, (3) access to course content is facilitated, (4) learners are engaged in discussions and decisions, and (5) the program provides for real and simulated communication to and from the learner. Eleven strategies that are favorable to distance teaching and thus facilitative of distance learning are postulated. These include involving students in the selection and evaluation of course goals, using course materials that are characterized by a conversation style and highly readable, selecting instructional media on the basis of individual student needs and the requirements of the subject area being studied, handling assignments quickly, making assignments that require students to solve problems or make decisions, and providing self-checking exercises. The paper concludes with 11 hypotheses that can be tested to assess the validity of the proposed theory. A 40-item reference list concludes the document. (MN)

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FernUniversität
Gesamthochschule

ZIFF PAPIERE 60

THE FEASIBILITY OF A THEORY OF TEACHING FOR DISTANCE EDUCATION AND A PROPOSED THEORY

Börje Holmberg

1 What basic characteristics distinguishing it from self-directed learning should distance teaching have to be able effectively to help students to learn ?

2 What procedures and measures make pre-produced courses and non-contiguous communication effective as teaching instruments?

3 Why are the basic characteristics and methods chosen effective?

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SUMMARY

This paper discusses the theory concept as related to distance education. Epistemological questions of relevance in this context are looked into. Here belong induction vs deduction, positivism vs rationalism, causality vs indetermination, explanation vs technological deduction of predictions. Theory is taken to mean a set of hypotheses logically related to one another in explaining and predicting occurrences.

The concept of teaching is analysed in a similar way contrasting teaching regarded as a commoditiy to be transferred with approaches focusing attention on the development of the learner. Teaching is taken to mean facilitation of learning.

The author develops for distance education a theory of teaching capable of generating testable hypotheses of the types 'If A, then B', 'The more (less) A, the more (less) B'. Some of these hypotheses have, in fact, already been tested. The theory claims to contribute an applicable general outline of effective teaching in distance education. It identifies suitable initial behaviour (student participation in goal considerations, subsumption under existing cognitive structures), it prescribes essential pervasive characteristics of course materials implying clear recommendation for course-development work, and it specifies requirements for mediated communication, all relying on personal approaches.

ZUSAMMENFASSUNG

Dieses Papier enthält eine Darstellung eines Theoriekonzepts am Beispiel des Fernstudiums. Epistemologische Fragen, die in diesem Zusammenhang wesentlich sind, werden untersucht, wie Induktion versus Deduktion, Positivismus versus Rationalismus, Kausalität versus Indeterminismus, Erklärung versus technologische Schlußfolgerungen aus Vorhersagen. Theorie wird verstanden als ein Set von Hypothesen, die in logischer Relation zueinander stehen und Ereignisse sowohl erklären als auch vorhersagen.

Das Konzept Lehren wird in ähnlicher Weise analysiert; der Ansatz, der Lehren (Unterrichten) als Weitergeben von Lehrstoff betrachtet, wird Ansätzen gegenübergestellt, deren Aufmerksamkeit sich vorwiegend auf die Entwicklung des Lerners konzentriert. Lehren wird primär aufgefaßt als Förderung des Lernens.

Der Autor entwickelt eine Lehrtheorie für das Fernstudium, die die Ableitung prüfbarer Hypothesen der Art "Falls A, dann B", "Je mehr (weniger) A, desto mehr (weniger) B" ermöglicht. Einige dieser Hypothesen sind bereits überprüft worden. Die Theorie soll einen praxisnahen allgemeinen Beitrag zu effektiver Fernlehre bieten. Sie zeigt geeignete Lehrmöglichkeiten für den Studienbeginn auf (Lernzielüberlegungen unter Beteiligung der Studierenden, Subsumption unter vorhandene kognitive Strukturen), sie schreibt grundsätzlich erforderliche Charakteristika von Kursmaterialien vor unter Angabe klarer Empfehlungen für die Kursentwicklung, und sie spezifiziert Erfordernisse für mediale Kommunikation, - alles basierend auf personenbezogenen Ansätzen.

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The subject of this paper is a tricky one. A great number of considerations will have to influence the discussion. For this and other reasons it seems to be useful to start by identifying working definitions of the concepts involved.

The concepts of teaching, distance education, and theory

It is quite common that both students and teachers regard 'knowledge as a commodity which can be transferred, by the act of teaching, from one container to another or from one location to another. Such people (among them no doubt a great many distance educators /B.H./) tend to express their view of teaching as "imparting knowledge" or "conveying information"'(Fox 1983 p. 152). There are several arguments against this rather primitive view of teaching, as made clear by Fox in the paper quoted. The main reason why I reject it is its implicit view of learners as passive receivers, which cannot be a true picture. I regard teaching as facilitation of learning (cf. Rogers 1969) meant to lead to a goal of some kind (self-realisation, an examination, professional competence or some other goal). This definition is important to rid us of the well-grounded objection that teaching and learning are sometimes little related to each other. It has rightly enough been said that when something has been learnt in a teaching-learning situation, learning may have been caused by other influences than those of the teaching. When something has been taught we do not know whether something has been learnt, and, in fact, if something has been learnt we do not automatically know what; possibly something different from what was intended by the teaching has been learnt (cf. Loser & Terhard 1977 p. 29). Teaching is an attempt - and sometimes a successful attempt - to facilitate learning towards some goal.

The concept of distance education is taken to cover the various forms of study at all levels which are not under the continuous, immediate supervision of tutors present with their students in lecture rooms or on the same premises, but which, nevertheless, benefit from the planning, guidance and tuition of a tutorial organisation. Distance education is above all characterised by two constitutive elements, i.e. pre-produced learning materials and mediated communication between students and a supporting organisation with its tutors etc.

The theory concept is problematic. In scholarly literature theory is a term used to denote different concepts. It is

frequently used to refer to any systematic ordering of ideas about the phenomena of a field of inquiry (Gage 1963 p. 102) as, for instance, when reference is made to the theory of distance education. This (or simply the opposite of practice?) is also meant when chairs at, for instance, German universities are devoted to 'theory of education' (Theorie der Erziehung) or 'theory of the school' (Theorie der Schule). This vague use of the term theory can be rather confusing as in other scholarly contexts a theory means a set of hypotheses logically related to one another in explaining and predicting occurrences. The hypotheses are then of the types 'if A, then B' or 'the more A, the more/less B'. It is this last-mentioned use of the term theory that is applied in this paper.

Theory and empirical data

Empirical data can confirm, refute or leave unresolved hypotheses of this kind. The normal starting point is a so far unsolved problem, for instance that of the influence of varying frequencies of assignment submission in distance education. Relevant data are then traced, collected and evaluated to help to solve the problem.

Whether or not research intended to contribute to the solution of a problem is based on a theory expressis verbis depends both on the type of problem and on the philosophy of the researchers concerned. It is perfectly possible to investigate a subject area without any formulated theory, with a view to finding the answers to one or more questions. Experiments on teaching specific contents by different methods and/or by means of different textbook approaches, different types of exercises, etc., may be - and have been - conducted without any explicit reference to a theory developed by the researchers (but naturally based on the theories of the competing methods and the theoretical position that causes the research). If, for instance, we wish to know whether a certain curriculum content in a foreign language is learnt more effectively by an imitative method or by a cognitive method, this problem can be investigated without the backing of a theory indicating an expected answer. It is possible, but not necessary, to hypothesise that one or the other of the methods is the more effective of the two or to assume that there is no difference, the so-called null hypothesis.

Whereas in the heyday of positivism and behaviourism it was considered acceptable to collect and evaluate data without any clear theoretical background, which, in fact, meant an inductive approach, it is now much more common to insist that a theory to guide this study and make deductions possible must be developed before any empirical investigation is made. In Popper's spirit induction has become something of a dirty word. Cf., however, Covill-Servo & Hein 1983 p. 306.

What, then, is the logical background of this insistence on an explicit theory preceding an empirical investigation? Is it a consequence of a desire to define in advance what is worth while investigating and creating awareness in the scholar's mind of what is reasonable to expect? Or is it largely - or in combination with the reasons referred to - an attempt to make the study deductive rather than inductive in character? Those adhering to Popper's epistemological principles will insist that understanding and explanation require deductive theories.

I fear that in many cases in point here the distinction between induction and deduction is rather illusory. The knowledge of numerous instances of something happening, i.e. an inductive process, may cause the development of a theory from which are deduced possibly refutable hypotheses, which are then tried empirically. This could, for instance, occur (and has occurred) after constantly recurring experiences of the learning-supporting influence of personal approaches in distance education.

The real problem here would seem to be whether the basic observations made by the researcher before the theory is worded have been subconsciously structured by his expectations or general thinking. This would not then be a case of induction proper. It is more doubtful if we have reason to postulate an implicit theory as to the expected outcome of the study of two competing methods for language learning. This seems to be a school example of an inductive study unless, which has been done, a theory is provided from which a refutable answer is deduced. The empirical study made can be identical in the two cases, however.

In the background of this game there is a complicated philosophical problem concerning what Bertrand Russell calls the validity of inference, i.e. of induction in the sense of inferring general laws from particular instances: 'A very little consideration shows that, logically, the inference cannot be demonstrative, but must be at best probable. It is not logically impossible that my life may be one long dream ... If we are to reject this view, we must do so on the basis of an inductive or analogical argument, which cannot give complete certainty (Russell 1951 p. 278).

The powerful objections against the clear-cut positivist assumptions of the reliability of inductive conclusions that Popper and his school of 'critical rationalists' have delivered would seem to make many scholars healthily wary of inductive methods (Popper 1980 pp. 27-30, 254-265). The critical rationalists are no doubt right in insisting that theories cannot be proved, that we must accept permanent uncertainty, and that theories to be studied deductively must be empirically refutable rather than confirmable so that the non-refuted theory is simply considered to have a higher degree of verisimilitude than its competing counterpart. However, this does not fully do away with the seemingly artificial technical conversion of induction into deduction described as a game above. On the other hand it does

lead to attempts to bring order and cohesion into the many-sided observations and occurrences that are studied, and so it gives a mighty stimulus to providing a framework of theory as the starting point of research.

The feasibility of a theory of teaching

Against this background let us look at attempts made in relation to what can or should be expected of a deductive theory of teaching. It is common practice to expect of such theories that they should inter alia

- have internal consistency as logical systems
- establish functional relationships between the teaching and the outcomes of learning
- should be capable of generating specific hypotheses and predictions (cf. Snow 1973 pp. 104-105)
- be expressed in such a way that research data capable of possibly refuting (falsifying) the theory can be collected.

Bruner refers to four major requirements of a theory of instruction, namely:

1. specifying experiences effectively implanting 'in the individual a predisposition toward learning';
2. defining 'optimal structure' conducive to 'simplifying information', 'generating new propositions', 'increasing the manipulability of a body of knowledge' and 'related to the status and gifts of the learner';
3. specifying 'the most effective sequences in which to present the materials to be learned';
4. specifying 'the nature and pacing' of extrinsic and intrinsic reinforcement (in Bruner's terminology 'rewards and punishments')

(Bruner 1971 p. 40).

A theory of teaching of the type so far discussed is evidently predictive (technological) as opposed to a theory of learning which is descriptive in its attempts to explain how learning occurs. This understanding of the theory concept only partially agrees with Popper's epistemological principles, according to which the task of scholarship is on the one hand theoretical, to bring about explanation, on the other hand practical, to provide for application or technology (Popper 1972 p. 49). A predictive theory stresses the practical aspects, techniques and means more than explanation and thus does not meet Popper's requirements. It is more in line with H.A. Simon's type of normative theory, which 'rests on contingent propositions like: "If process X is to be efficacious for attaining goal Y, then it

should have the properties A, B, C" (Simon 1973 p. 473).[1)]

It would not seem to be very difficult to formulate a very general series of recommendations assumed to some extent to meet Bruner's requirements. However, as soon as we try to be more specific the difficulties predominate over the possibilities. Each subject has its own character and within each subject there are several specialities. All these subject areas will have their own requirements. Thus, for instance, specifying the most effective sequences as required by Bruner is one thing in a mathematical discipline and something quite different in a foreign language or in the social sciences. The prospect of listing all imaginable subject areas and for each of them specifying conditions in accordance with the requirements mentioned and co-ordinating these into a cohesive theory is intimidating, indeed. What is even worse, however, if a serious attempt is really made to create such a comprehensive theory of teaching, is the fact that human beings between them as well as their conditions of life and learning are so different that it seems impossible to prescribe in any detail what the teaching should be like that could meet the requirements mentioned by Bruner.

There can be no doubt that a general theory of teaching of this kind applicable to all kinds of and all individual students as well as to all imaginable study areas and all frame factors is an impossibility. Hosford articulates this impossibility in two laws: '(1) It is necessarily impossible to determine the absolute value of any instructional procedure by any experiment whatsoever; (2) It is necessarily impossible to determine an absolute set of instructional procedures that will be "best", for different learners, or for different learnings by one learner' (Hosford 1973 pp. 87 and 114).

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1) According to Popper the aim of the theoretician 'is to find explanatory theories (if possible, true explanatory theories); that is to say, theories which describe certain structural properties of the world, and which permit us to deduce, with the help of initial conditions, the effects to be explained. .... My explanation of explanation has been adopted by certain positivists or "instrumentalists" who saw in it an attempt to explain it away - as the assertion that explanatory theories are nothing but premises for deducing predictions. I therefore wish to make it quite clear that I consider the theorist's interest in explanation - that is, in discovering explanatory theories - as irreducible to the practical technological interest in the deduction of predictions. The theorist's interest in predictions, on the other hand, is explicable as due to his interest in the problem whether his theories are true; or in other words, as due to his interest in testing his theories - in trying to find out whether they cannot be shown to be false' (Popper 1980 p. 61).

If we attempt to develop a theory of teaching we must be much more modest than this. Education as a research area is, of course, concerned with human beings with personalities, hopes and wills of their own. If we are not determinists in the sense that we totally reject the assumption that human will is in any respect free, then it is impossible to postulate any automatic cause-effect principle in research aiming at optimising educational methods and procedures. Here theories usually have to be limited to statements to the effect that if such and such a measure is taken under specific circumstances, then this is likely to facilitate learning. This can be reworded into the semblance of a nomological theory, i.e. one that is always and under all circumstances applicable unless the validity is expressly limited to specific circumstances: If x, then conditions making y possible will be created. The situation is somewhat different in general learning theory and other descriptive rather than prescriptive studies. It has been suggested that an agent's decision-scheme, i.e. set of attitudes to reality, problems and solutions, dictates what he will do if he acts rationally: when A, then the rational action will be B (Lessnoff 1974 p. 89 on Watkins' 'imperfect rationality').

This cautious conclusion is to be compared with Hosford's appreciation of the influence of teaching. Starting out from his 'axiom' that 'change is the only absolute in education' he modestly claims that 'instructional events affect the pace and direction of change' (Hosford 1973 pp. 87 and 114). Change here is deduced from the goal-orientation of teaching.

The possible content of a theory of teaching for distance education

My preliminary assumption is that distance teaching can, like Hosford's general 'instructional events', affect the pace and direction of learning. The content of a distance-study course, its general approach (for instance, authoritative statements of facts and 'correct' answers or solutions of problems vs problems as directing and guiding the learning process, i.e. the search for answers, with discussions of possibilities and encouragement of students' own contributions), the tuition provided (mainly correction or argumentative discussion of students' suggestions) are doubtless decisive for the direction of learning. The pace of learning is influenced by such things as the readability of course materials, the frequency and turn-round time of submission assignments, the media used, etc. It would not seem to be presumptuous to go a little further. No doubt the retention of what has been learnt can be influenced by teaching procedures applied to distance education (closeness to practice, enactive methods and media, for instance the use of laboratory kits, exercises with comments, etc.). Further it goes without saying that the educational content of a pre-produced course is within

the field of teaching influence in distance education. This is related to the view of teaching and learning embraced by course developers and tutors. Fox identifies four approaches or 'basic "theories of teaching"'. There is the transfer theory which treats knowledge as a commodity to be transferred from one vessel to another. There is the shaping theory which treats teaching as a process of shaping or moulding students to a predetermined pattern. Thirdly, there is the travelling theory which treats a subject as a terrain to be explored with hills to be climbed for better viewpoints with the teacher as the travelling companion or expert guide. Finally, there is the growing theory which focusses more attention on the intellectual and emotional development of the learner. These theories are reflected by, and interact with, the views that students have of the process of learning. Whichever theory a teacher uses to help him/her think about the process it will affect the strategies she/he uses and it will colour his/her attitudes to students and to any training programme that she/he untertakes' (Fox 1983 p. 151).

Our view of what learning is influences teaching, which cannot but influence the learning outcome in some way. If course developers consider knowledge to be a ready-made product ('a commodity to be transferred') their courses will be rather different from those written by persons who favour problem solving approaches. Monika Weingartz has, on the basis of a consistent view of learning as understanding and problem-solving, provided an in-depth analysis of some distance-study courses from different parts of the world illustrating these differences (Weingartz 1980 and 1981), and Helmut Lehner has developed a learning theory bearing on this. He describes all learning as problem-solving in the sense that it is composed of making assumptions (i.e. developing hypotheses) and modifying these as the learning progresses - an application of Popper's epistemological principle of 'conjectures and refutations'. This leads Lehner to what (like Wagenschein and others) he terms a 'genetic learning approach' (Lehner 1978 and 1979). Starting out from problems instead of from the comprehensive systems that the knowledge amassed through the centuries constitute (for instance, when studying gravitation asking the questions of Aristotle and Galileo in the way Einstein & Infeld do instead of starting by learning the solutions found) favours genetic learning (Lehner 1978 pp. 76-77). Weingartz's theoretical approach is linked with Lehner's and has led her to study current practice in distance education. To judge from her study, much remains to be done to improve problem-solving learning in distance study, where on the whole the 'ready-made system' presentation dominates, although guidance in far-reaching problem-solving occurs in some courses.

There can be no question of our universally preferring one type of learning or one of Fox's types of teaching only. The target groups, the study objectives, the academic levels and similar

considerations vary, and so must the teaching/learning approaches. Even those who accept Lehner's learning theory, according to which learning is problem solving, will recognise the need for different procedures related to types of teaching and learning. In university study problem-solving approaches including critical use of sources and the application of Fox's growing theory are usually appropriate. It is more questionable if they are applicable to, for example, a postman's learning of lists of post offices along railway lines by heart (even though this is also a kind ofproblem solving according to Lehner, the problem being how best to commit the items to memory). Between these extremes there are vast numbers of teaching/learning situations with specific requirements.

These considerations (content, direction and pace of learning, retention, types of teaching and learning) and no doubt a great many others are relevant to any theory of teaching for distance education. When below - in agreement with my view of teaching as facilitation of learning - I refer to certain teaching factors as favourable to learning, the implication is that they are taken to favour the ease and speed of learning as well as its quality and retention.

Potentials and limitations of theories of teaching for distance education

As shown above it seems impossible to develop a theory of teaching universally applicable to all students, all conditions and all subject areas. It is very proper to give up the attempt to create theories of this kind. The question is if this means that we must also do without less exacting theories of teaching for distance education. It is certainly the safe approach as anyone trying to formulate any theory of this type lays himself/herself open to easily motivated attacks. Per definitionem a crude theory attempt of the type possibly within reach must be very general and leave many considerations out of account. The choice of considerations must then be to some extent idiosyncratic and unlikely to be universally accepted. Nevertheless I will try to formulate a kind of theory generating hypotheses which seem to me generally relevant and decisive for teaching at a distance.

A general problem is if we can at all postulate cause-effect relationships when - as in distance education and all kinds of education - human beings are concerned. In my view this is not possible except as explained above in my reference to the semblance of a nomological theory. This means that a theory of teaching for distance education can include no other hypotheses than those stating that if teaching characterised in a particular way is applied, then this is likely to (or: will in most cases) facilitate learning.

A theory of distance education may be expected to indicate and explain the consequences of the various procedures and media applied to target groups of various kinds and to various frame factors. While, as apparent from the above, I regard it as impossible to develop a theory covering all imaginable cases of this kind, something can no doubt be done in this direction.

It is important to make clear what type or types of distance education a theory is focused on. Michael Moore has clarified important differences of degree in his analysis of the concept of distance. He describes distance in an educational programme as 'a function of dialogue and structure'. 'Dialogue is the extent to which interaction between learners and teacher is possible'. Structure is the planned course presentation. 'To the extent that a program "consists of pre-produced parts, at least in the form of particularized plans listing item by item the knowledge and skills to be covered by the Program"[1] the programme may not be responsive to learners' idiosyncracies, and structure is said to be high (Moore 1977 pp. 18-19). The highest degree of distance occurs when an person studies without any support at all, which Moore describes as programmes with no dialogue and no structure and exemplifies by independent reading - study programmes of the 'self-directed' kind (Moore 1977 p. 38).

A theoretical approach to distance education can start out from various points on the continuum described, for instance from a comparison with face-to-face teaching with its high degree of dialogue (cf. Peters 1973) and from systems making ample use of supplementary face-to-face sessions. My approach will be from the other end of the continuum, investigating 'pure' distance education, i.e. teaching exclusively at a distance, which is in any case the basis of distance education. My questions are:

1 What basic characteristics distinguishing it from self-directed learning should distance teaching have to be able effectively to help students to learn?
2 What procedures and measures make pre-produced courses and non-contiguous communication effective as teaching instruments?
3 Why are the basic characteristics and methods chosen effective?

From here it will, of course, be possible to probe into types of distance education of various kinds, which, however, will not be done in this paper. However, attempts to develop typologies of distance education of relevance also in this context have been made (El Bushra 1973, Holmberg 1981).

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1) A quotation from Holmberg 1969 p. 60.

A suggested theory of teaching for distance education

Against this background and with the reservations mentioned in mind I describe my theory of teaching for distance education like this:

General background assumptions are

- that the core of teaching is interaction between the teaching and learning parties; it is assumed that simulated interaction through subject-matter presentation in pre-produced courses can take over part of the interaction by causing students to consider different views, approaches and solutions and generally interact with a course
- that emotional involvement in the study and feelings of personal relation between the teaching and learning parties are likely to contribute to learning pleasure
- that learning pleasure supports student motivation
- that participation in decision-making concerning the study is favourable to student motivation
- that strong student motivation facilitates learning
- that a friendly, personal tone and easy access to the subject matter contribute to learning pleasure, support student motivation and thus facilitate learning from the presentations of pre-produced courses, i.e. from teaching in the form of one-way traffic simulating interaction as well as from didactic communication in the form of two-way traffic between the teaching and learning parties.
- that the effectiveness of teaching is demonstrated by students' learning of what has been taught.

The first six of these assumptions, though used deductively, could be described as being based on inductive observations. The uncertain distinction between deduction and induction discussed above would seem to apply. Whatever their provenance, the assumptions constitute the basis of what I consider to be essential teaching principles for distance education. Thus I formulate my prescriptive teaching theory as follows:

> *Distance teaching will support student motivation, promote learning pleasure and effectiveness*
> *if it is provided in a way*
> - *felt to make the study relevant to the individual learner and his/her needs*
> - *creating feelings of rapport between the learner and the distance-education institution (its tutors, counsellors etc.)*
> - *facilitating access to course content*
> - *engaging the learner in activities, discussions and decisions; and*
> - *generally catering for helpful real and simulated communication to and from the learner.*

This general theory of mine seems to have explanatory value in

relating teaching effectiveness to the impact of feelings of belonging and cooperation as well as to the actual exchange of questions, answers and arguments in mediated communications. It is a communication theory which causes me to identify as favourable to teaching, i.e. facilitation of learning:

1 a presentation of course goals or objectives engaging the student in the evaluation of their relevance and, if at all possible, in their selection

2 a course structure carefully based on required earlier learning making sub-sumptions in Ausubel's sense[1] possible and more or less a matter of course

3 pre-produced course materials characterised by a conversational style with invitations to an exchange of views and with attempts to involve the student emotionally

4 a style of presentation that is easily accessible; a high degree of readability of printed course materials

5 graphical and typographical presentations facilitating access to printed courses and selection of relevant subject matters

6 a choice of media, sequencing and other principles for course presentation adapted to student needs and to the requirements of subject areas studied, e.g. those of operations on knowledge and operations with knowledge (Chang et al., pp. 14-16)

7 communication facilities (in writing, on the telephone and/or by audio tape) constantly open to students for questions and exchanges of opinions with tutors and counsellors

8 frequent submission of assignments requiring students to solve problems, evaluate texts or recordings

9 friendly, helpful and extensive tutor comments on assignments submitted with suggestions expressed in a way to promote personal rapport between student and tutor; the same approach should characterise computer-marked and computer-commented assignments

10 quick handling of assignments so that students need not wait for more than a week to have their work returned with corrections and comments

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1) Cf. Ausubel's guiding principle: 'If I had to reduce all of educational psychology to just one principle, I would say this: The most important single factor influencing learning is what the learner already knows. Ascertain this and teach him accordingly' (Ausubel 1968 before the Preface).

11 self-checking exercises in pre-produced courses through which students are induced to practice skills (in, for instance, foreign languages, mathematics, statistics); not only model answers should be provided, but also extensive comments based on course writers' experience of likely errors and misunderstandings.

It would, of course, be possible to specify each of these statements in more detail (for instance a plan for discussion contributions to be compared with the course writer's suggestions in the seventh and ninth statements) and also to add any number of characteristics likely to promote learning. I have limited my statements to those above as they seem to be fairly universally acceptable (even though they may not be really accepted). Others might like to add supplementary face-to-face sessions, and personally I think students' individual pacing with the right to submit assignments at any time (regardless of prescribed or suggested timetables) would be favourable. I consciously omit these and other controversial characteristics which can, but need not, belong to the statements specifying the theory.

While this is admittedly a leaky theory, does it meet the requirements specified above under 'The feasibility of a theory of teaching'? I think so. It is true that it is not - and cannot be - nomological, i.e. deterministic, its background can, in spite of its deductive form, be interpreted as inductive, and it no doubt has too much of an instrumentalist character to meet Popperian requirements - all reservations discussed above - as it is a normative theory. However, it is not devoid of explanatory power: it does, in fact, indicate essential characteristics of effective distance education referring successful applications to personal relevance, feelings of rapport, student influence and helpful communication. The theory would seem to be logically consistent and it does establish functional relationships between teaching and expected outcomes of learning. As to the requirements that it should be capable of generating hypotheses and predictions and be expressed in such a way that research data capable of possibly falsifying the theory can be collected, let us look at each statement in turn:

ad 1) An empirical study of alternative presentations of goals/objectives, one simply prescribing them, the other inviting students to discuss their relevance and, possibly, to influence their selection, could be made by providing two groups of students, selected at random among students of equal standard, with alternative versions. The attitudes of the students could be measured immediately after the presentation of objectives and after course completion; then course completion and achievement levels could also be compared. The hypothesis could be worded like this:
- If students are engaged in the evaluation of the relevance of suggested study objectives (and/or are given the opportunity to influence their selection), then their

attitudes to the study will be more favourable and their achievements will be better than if objectives are simply prescribed (The more ..., the better ...).

It would also be possible to test similar hypotheses based on the more radical suggestions for student autonomy made by Ljosa & Sandvold 1983.

ad 2) A reference to Ausubel's studies here should be sufficient.

ad 3) This statement has been empirically studied - and given some statistical support - on the basis of four hypotheses:

- The stronger the characteristics of guided didactic conversation, the stronger the students' feelings of personal relationship between them and the supporting organisation.

- The stronger the students' feelings that the supporting organisation is interested in making the study matter personally relevant to them, the greater their personal involvenment.

- The stronger the students' feelings of personal relations to the supporting organisation and of being personally involved with the study matter, the stronger the motivation and the more effective the learning.

- The more independent and scholarly experienced the students, the less relevant the characteristics of guided didactic conversation.

(Holmberg, Schuemer & Obermeier 1982)

ad 4) The relevant hypotheses here would be:

- The more easily accessible the preproduced course, (the more readable the texts), the better the outcome of learning.

Among studies of this kind, necessarily operationalising the readability concept to make its influence testable, should be mentioned Langer, Schulz von Thun & Tausch 1974.

ad 5) It would be possible to operationalise Waller's concept of access structure (Waller 1977a and b) and test the hypothesis that

- if access-structure measures such as headlines, graphics and other typographical means are applied, then the learning outcome is improved in relation to the study of the same text without this access structure.

An empirical study could easily be arranged comparing two matched groups. Doerfert 1980 has studied this problem theoretically and empirically from the points of view of distance education.

ad 6) Hypotheses for individual principles, media and target groups can be formulated and tested empirically; this is the weakest of the eleven statements as in itself it implies no prediction, but merely indicates that predictions may be tested by empirical studies of individual principles or media under specific circumstances.

ad 7) The hypothesis that

- if communication facilities of the kind described are provided, students will be more motivated and more successful than if left to themselves

could easily be tested, but seems to be too generally accepted among those concerned with helping students and too little interesting to those satisfied with information dissemination to have made anybody undertake this study.

ad 8) John Bååth's empirical investigation of this subject implied testing eleven hypotheses concerning differences caused by varying degrees of submission frequency with regard to study perseverance, attitudes, achievements and study time (Bååth 1980).

ad 9) The hypotheses here would be:

- If tutor comments are expressed in a personal style and are ostensibly based on a wish to be helpful (a matter of formulation), then students will be more satisfied with their study and the learning outcomes will be better than if the tutor comments consist of factual statements only.

This hypothesis is evidently empirically testable.

ad 10) This statement has been empirically tested - and has been given remarkably strong research support (Rekkedal 1983).

ad 11) It would be feasible to test the hypothesis that

- if a course contains self-checking exercises of the type mentioned, its students will be more succesful than matching students taking the same course without these exercises.

An empirical study by Bååth of the possibility of replacing considerable numbers of submission assignments

by self-checking exercises seems to indicate that exercises of the latter type with model answers and comments have no small potentials (Bååth 1980 p. 152).

The function of the theory suggested

The statements made about what facilitates learning in distance education can thus - if the criteria listed above in concurrence with Bruner, Simon, Snow and others are accepted - be called a theory. With my definition of teaching it is a theory of teaching. As such, has it anything to convey or is it, because of its openness and lack of detailed prescriptions for every possible situation, merely an empty truism?

If a truism, the theory would be generally accepted. It is most unlikely that it should be considered indisputably correct and to the point. In common practice there is implicit evidence to the contrary: Many courses for distance education are developed in a handbook style entirely contrary to statements 1 and 3. It is exceptional rather than the rule that a participative approach as presented in statement 1 is applied. Some distance-education organisations pay little attention to the accessibility of their courses, whether readability is meant as in statement 4 or typographical facilitation is meant as in statement 5. Also statement 6, in spite of its meagre content, prescribes principles frequently not adhered to. The medium or media are rarely chosen on the basis of students' needs and more often in relation to tradition or availability (e.g. TV time to be shared between faculties and subjects).

Even greater deviations from the theory are apparent when the communication aspect is considered. Many distance educators pay scant attention to (and many probably do not recognise) the requirements of statements 7 and 8, whereas lip-service is often paid to statement 9. Statement 10 clearly differs both from prevalent theory and practice (in spite of remarkably univocal research support!), whereas statement 11 is probably more in accordance with common notions and practice than the other statements.

It is uncertain to what extent statement 2 with its adherence to Ausubel is usually accepted. Nominally the identification of entrance qualifications may be interpreted as acceptance, but may also be nothing but a concession to the requirements of formal educational systems. There is, on the other hand, nothing in statement 2, in spite of its reference to Ausubel, the cognitivist, that constitutes a rejection of behaviourist approaches. While I do not recognise the claims of behaviourism, my theory need not necessarily clash with modified behaviourist thinking. A behaviourist teaching/learning situation may, for example, be appropriate in the specific training of postmen referred to above.

The theory suggested is apparently not entirely devoid of content although - and this must be admitted without any reservation - is does not offer solutions to very specific teaching problems in distance education. It does not prescribe steps to be taken in the teaching of individual subjects at specified levels or with special types of students and it contains to taxonomy for media selection or structuring measures. This, in my view, reflects not only a realistic appreciation of what is possible, but also a humane approach to what is desirable.

As evident from my earlier writings on theory (Holmberg 1978, 1982, 1985 Chapter 2, etc.) I favour a liberal approach allowing the individual as much freedom in teaching and learning as possible and above all advocate far-reaching learner autonomy (in the spirit of Moore 1983, for instance). Independently of the feasibility problems this makes me reluctant to try to prescribe detailed procedures and it influences my theory as it is technological and predictive in character. The realisation that no two individuals are alike, that needs, preferences and capabilities of students and the requirements of subjects and levels vary very much indeed causes me to find it desirable that a technological theory of teaching should avoid attempts at step-to-step prescriptions for a number of specific situations as this would be tantamount to trying to mould all students in one form (cf. Fales & Burge 1984). Thus I think such a theory of teaching should limit itself to assumedly widely generalisable recommendations. At the same time it should be borne in mind that a theory of teaching can foresee merely what is likely to facilitate learning, not what will under all circumstances cause learning.

What does the proposed theory contribute then? I believe it provides an applicable general outline of effective teaching in distance education. It identifies suitable initial behaviour (student participation in goal considerations, subsumption under existing cognitive structures), it prescribes essential pervasive characteristics of course materials implying clear recommendation for course-development work, and it specifies requirements for mediated communication, all relying on personal approaches.

These prescriptive aspects agree and largely coincide with my attempted theory of the guided didactic conversation.[1] It implies that the character of good distance education resembles that of a guided conversation aiming at learning and that the presence of the typical traits of such a conversation facilitates learning. The distance-study course and the non-contiguous communication typical of distance education are seen as the

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1) This theory, the testing of which is fully reported in Holmberg, Schuemer & Obermeier 1982, is summarised in Sewart, Keegan & Holmberg (1983) pp. 114-122.

instruments of a conversation-like interaction between the student on the one hand and the tutor and/or counsellor of the supporting organisation administering the study on the other. There is constant interaction ('conversation') between students and their supporting organisation (authors, tutors, counsellors), simulated through the students' interaction with the pre-produced courses and real through the written and/or telephone interaction with their tutors and counsellors. It is my contention that this theoretical approach together with the theory of teaching for distance education attempted above has something to say about the general character of well-functioning distance education, its ethos and underlying philosophy.

Debate required

In the interest of both the practical application and the academic discipline of distance education it would seem to be valuable if its theories of teaching were to be further discussed. Alternative theories unrelated to or rejecting mine as well as attempts to elaborate on the attempt made above would be welcome contributions to the debate.

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